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Section:

Serial #:

UNIVERSITY OF BAHRAIN
DEPARTMENT OF COMPUTER SCIENCE
ITCS241: Assembly Language Programming

FACULTY OF INFORMATION TECHNOLOGY
SEMESTER I – 2004/2005
First Test Date: NOV 9, 2004

Question #	1	2	3	4	5	6	7	8	9	10	11
Answer											

QUESTION ONE: Choose the correct answer for each of the following questions (1 ...11) and write it down in the above table { 11 x 1 = 11 points}

- 1) MOV AX, 205H
MOV BX, 5608H
DIV BL

a) AX=0540H b) AX=4005H c) AX=1225H d) AX=2512H e) None

- 2) MOV AX, 3A80H
MOV BX, 4F40H
MUL BL

a) AX=3200H b) AX=2000H c) AX=0E80H d) AX=2780H e) None

- 3) MOV AX, A7H
MOV CX, 50H
MOVSX AX, AL
IDIV CL

a) AX=F7FFH b) AX=F701H c) AX=0901H d) AX=0701H e) None

- 4) MOV AX, 90H
MOVSX AX, AL
MOV DL, 30H
IMUL DL

a) AX=2700H b) AX=EB00H c) AX=DE00H d) AX=2100H e) None

- 5) The addressing mode used in the instruction: XCHG [BX], AL is _____.
a) Indexed b) Direct c) Immediate d) Indirect e) None

- 6) The addressing mode used in the instruction: SUB MY [BX], AL is _____.
a) Indexed b) Direct c) Immediate d) Based indexed e) None

- 7) The 8-bit value 1100 0011 represents unsigned decimal value _____ and signed decimal value _____.
 a) 195, -195 b) 195, +61 c) 195, -61 d) c3, -43 e) None
- 8) The range of signed numbers that can be stored in a word of 10 bits is from _____ to _____.
 a) -1024, +1024 b) -512, +512 c) -1024, +1023 d) -512, +511 e) None
- 9) In a machine with 20 address lines and 24 data lines, the maximum size of directly addressable main memory is _____ Mbytes.
 a) 1 b) 16 c) 8 d) 144 e) None
- 10) In instruction cycle, the _____ step determines the required actions and instruction size.
 a) Instruction Fetch b) Decode c) Execute d) Operand Fetch e) None
- 11) The file "Bahrain.lst" can be generated by the _____ program.
 a) LINK b) MASM c) DEBUG d) Operating System e) None

QUESTION TWO: Study carefully the following code and answer the following questions (12 ...16):
 { 5 x 1 = 5 points}

```
.data
TST WORD 3F2CH, 25FFH, 7A8BH, 4924H, 0F97EH
WORD 7000H, 6000H, 5588H, 0FFFAH, 0C100H
V9 WORD ?

.code
MOV SI, OFFSET TST
MOV AX, LENGTHOF TST
MOV BX, 4
MOV V9, SIZEOF TST
MOV SI, V9
SUB SI, TYPE TST
MOV DI, TST[BX]
MOV DX, TST[SI]
```

- 12) After executing the above code, AX register will contain _____ H.
- 13) After executing the above code, SI register will contain _____ H.
- 14) After executing the above code, DX register will contain _____ H.
- 15) After executing the above code, DI register will contain _____ H.
- 16) After executing the above code, V9 variable will contain _____ H.

QUESTION#1: Answer each of the following questions as indicated:

[7 points]

- a) Give no more than 2 instructions to subtract $M4 = M4 - M3$, where $M3, M4$ are defined memory doublewords

- b) Give no more than 3 instructions to subtract $L3 = L3 - 2 * L4$, where $L3, L4$ are defined memory words.

- c) Give 1 directive to define an array named `ITCS241` consisting of 1024 elements (each is 8 bytes), each is initialized with `33FFh` value.

- d) Give no more than 1 instruction to sub the value `48FFh` from the memory word pointed by `ESI` register.

- e) Give no more than 2 instructions to store the value `6500h` in `FS` register.

QUESTION#2: Fill in blanks as required

[10 points]

- a) Labels used in assembly programs are of 2 types: _____ and _____

- b) The assembler accepts as input a _____ program and produced as output an _____ program.

- c) The range of signed numbers that can be stored in ONE WORD is from _____ to _____.

- d) The unsigned numbers represented using 12 bits range between _____ and _____.

- e) The value $(11101000)_2$ represents a signed number (_____)₁₀, and unsigned number (_____)₁₀.

- f) In real mode, if the address of the first byte in a segment is `4FFC0`, then the segment last word address is _____ H.

- g) In addition to an `obj` file, the `MASM` produces 2 files: _____ and _____.

- h) An assembly program contains 2 types of statements: _____ and _____.

QUESTION#3:

[7 points]

Study carefully the following data definitions and answer the next 5 questions:

```
C1 equ "F"
D1 DB 4 DUP(C1, -128)
M1 dd 0AA88H, 77FF55H
a3 DW 3acfh, -9, ?
```

[7 points]

QUESTION#1: Answer each of the following questions as indicated:

- Give no more than 2 instructions to subtract $M4 = M4 - M3$, where $M3, M4$ are defined memory doublewords.

- Give no more than 3 instructions to subtract $L3 = L3 - 2 * L4$, where $L3, L4$ are defined memory words.

- Give 1 directive to define an array named ITCS241 consisting of 1024 elements (each is 8 bytes), each is initialized with 33FFh value.

- Give no more than 1 instruction to sub the value 48EFh from the memory word pointed by ESI register.

- Give no more than 2 instructions to store the value 6500h in FS register.

[10 points]

QUESTION#2: Fill in blanks as required

- Labels used in assembly programs are of 3 types: _____ and _____
- The assembler accepts as input a _____ program and produced as output an _____ program.
- The range of signed numbers that can be stored in ONE WORD is from _____ to _____
- The unsigned numbers represented using 12 bits range between _____ and _____
- The value $(11101000)_2$ represents a signed number (_____)₁₀ and unsigned number (_____)₁₀
- In real mode, if the address of the first byte in a segment is 4FFC0, then the segment last word address is _____ H.
- In addition to an obj file, the MASM produces 2 files: _____ and _____
- An assembly program contains 2 types of statements: _____ and _____

[7 po

QUESTION#3:

Study carefully the following data definitions and answer the next 5 questions:

```

C1 equ "P"
D1 DB 4 DUP(C1, -128)
M1 dd 0AA86H, 77FF55H
n3 DW 3acfh, -9, ?

```